

Roadside Development

WILBUR J. GARMHAUSEN
Chief Landscape Architect
Ohio Department of Highways

INTRODUCTION

Landscape architects realize that the movement of motor vehicles rapidly, efficiently and safely depends not only upon what happens in the traveled way, but also upon what happens in the roadside areas. Well planned roadsides promote safety and ease of travel and at the same time improve the physical and functional character of adjacent roadside areas.

The interstate highway system is the most dramatic construction program in the history of our country with roadsides playing an important part in this development. The new wide right-of-way is putting over fifty per cent of the right-of-way in the category of roadsides. This averages approximately thirty acres per mile of highway.

The conservation and development of an appropriate highway environment for the motorist and for the community are among the objectives set forth as a statement of policy for the national system which the American Association of State Highway Officials adopted in 1961. The statement called for careful consideration of the visual aspects of highway location and design from the standpoint of the users of the highways and of the people through whose community the highways pass.

The public has come to approve and appreciate the values of roadside improvement since 1933, when the Bureau of Public Roads encouraged each state highway department to include such work in its program, eliminating construction scars, flattening and rounding slopes, seeding, sodding and planting.

The need for highway landscape development was emphasized by the Bureau of Public Roads in 1939 in a report to Congress, "Toll Roads and Free Roads." A subsequent report "Interregional Highways" submitted to Congress in 1944, recognized that highway design rests on a balanced agreement of landscape and engineering principles which can be combined consistently with utilitarian functions.

The Federal-Aid Highway Act of 1956 set in motion an expanded long range program that called for close collaboration of all available

talent in every state in exercising imagination and foresight in planning and designing highways.

On February 8, 1965, President Johnson in his address to the Congress on the subject of "Natural Beauty", outlined his proposal for restoring and preserving the beauty of America. On the subject of highways the President had this to say:

"More than any country, ours is an automobile society. For most Americans the automobile is the principle instrument of transportation for work, daily activity, recreation and pleasure. By making our roads highways for enjoyment of nature and beauty we can greatly enrich the lives of nearly all people in city and countryside alike.

"Our task is two-fold, first, to ensure that roads themselves are not destructive of nature and natural beauty; second, to make our roads highways to recreation and pleasure.

"I have asked the Secretary of Commerce to take steps designed to meet this objective. This includes requiring landscaping on all federal interstate, primary and urban highways and encouraging the construction of rest and recreation areas along highways."

If roadside development is to be generally accepted as an integral part of highway construction and success is to be attained, cooperation and coordination between design, construction and landscaping are of utmost importance.

ROADSIDE DEVELOPMENT IN HIGHWAY LOCATION AND DESIGN

Roadside development features should be incorporated in the early stages of location and design so that the solution of each highway project will be effective and economical.

Appropriate landscape techniques integrated into the design and construction provide all known features of safety and utility for safe and relaxed driving, for economy of operation, and for pleasing appearance.

A large per cent of the interstate highway will not follow existing roads, but will traverse farm and woodlands well removed from dwellings and because of this may be lacking in interest. It will be controlled-access highway having the built-in safety factors of interchanges for crossings and turning movements. In most cases this will be separate roadways for opposite direction travel and other safety features which include freedom from the usual roadside distractions.

Landscape Architects

Roadside development is a part of the overall highway design and as such contributes in making the highway economical to build and to maintain, efficient and safe to use during a long service life. In his capacity the highway landscape architect needs to have a working knowledge of the principles of highway design, the mechanics of road construction and the problems of maintenance. He must be fully aware of the extent that this knowledge can be applied to a well balanced highway. Roadside development should blend with and become a part of the surrounding landscape.

The landscape architect deals with the living elements of highways. In roadside development even the soils are living things, they are the medium that give life to and sustain life in other living things. These living things are the materials of roadside development which within itself is concerned with the proper balance necessary for their survival, subsequent usefulness and contributing beauty. This enables the landscape architect to contribute to the amenities of the highways, as well as the functional practices of the well balanced highway.

Soils

The soils within the right-of-way are much different because of the cuts and fills than those found on the adjacent farm lands. There you will usually find level terrain and friable soils. Because of these variations a thorough knowledge of soils is necessary.

The greater percentage of the roadside areas will be in turf so the selection of grass seed, fertilizers, and mulches which are best suited to the area, soil, exposure and general climatic condition is of great importance. A closely knit sod will lower maintenance costs by helping to prevent the deposition of eroded earth in highway ditches, stop gullyng, permit the stabilization of shoulder soils and prevent the blocking or undermining of culverts. Good mechanical roadside equipment will help to keep the construction costs at a minimum and still give excellent results. A great number of new mulches can be used, and the kind selected will depend upon its potentiality, availability and cost.

Grade and Alignment

Because roadside conditions are variable in each situation, change of grade and alignment are necessary to promote safety and ease of vehicular movement as well as to conserve natural growth, allow for functional planting, and eliminate monotonous parallelism.

Highways designed as separate one-way roads may better fit the roadways with their accompanying roadsides into the landscape. Flexi-

bility in a pleasing free flowing alignment of widely separated roads, often at different levels, effectively avoids monotony and resultant driver fatigue. If treated as two separate roadways the design can take advantage of natural topography and landscape features, such as a stream or rock outcropping, and permit the conservation of existing plant material, generally resulting in a reduction of costs. The results of this variation in the line and grade of the two roadways allows for a wider median which in turn leads in a reduction of the hazards of glare from oncoming headlights, head-on collisions, and U-turns so that greater ease and relaxation is enjoyed by drivers. It also reduces excavation, snow drifting, and is easier to maintain.

The roadside is the important factor between the roadway and the adjacent property interest of the community through which it passes. The design of the roadside should be of such character that it will blend the roadways into the natural environment. It should also be a functional design easy to maintain and should promote safety, utility, economy, and beauty.

Curves and grades affect sight distance and safe operations. Flattened slopes of cut and fill and a well rounded cross section are essential to encourage vegetative growth, reduce the problems of scalping, lessen snow drifting, prevent soil erosion and permit easy operation of maintenance equipment. Rounded and warped slopes are needful to provide a smooth transition into the existing topography. In this way artificial appearance and uniformity of these slopes will be reduced. When grading, top soil should be saved to be used at some designated place either on slopes, berms, or planting beds. Stone and rock material should be salvaged when available and needed for use in protecting embankments against steam erosion.

Adequate width of roadsides are influenced by the topography, not only to allow for pleasing flat slopes as a protection against erosion, but also to allow for functional plantings, conserve the valuable existing plant material, and make possible a pleasing transition between the highway planting and the natural slope and trees adjacent to the right-of-way.

Clearing and Grubbing

Clearing and grubbing operations must provide for the conservation of desirable existing plant material to preserve the bordering vegetation and to create natural effects. Selective thinning should be done to preserve the natural environment and to open views into the offscap. Trees should be left to create an informal design pattern so that an irregular skyline effect will be forthcoming and the low growing trees and shrubs

will give an undulating effect. Undesirable trees such as weak, over-mature, or damaged trees and those obstructing a view should be removed. From a practical standpoint the conservation of existing plant material within the roadside areas should reduce the need for new material and tend to keep down costs. The introduction of other plant material will serve a functional purpose, but should be of the native variety to tie in with existing species.

PLANTS AND PLANTINGS

How to make the motorist conscious of the planting or natural scenery, or even the roadside itself is difficult. The motorist, moving through the landscape on a well paved highway, presents problems not found when the traveler had more time at reduced speeds to become aware of and to appreciate the views. So the highway engineer of today bears the great responsibility of building good roads and of also providing a pleasant highway offering an attractive drive through the landscape.

Design of Roadside Plantings

Improperly planned roadside development projects are foredoomed to failure as they waste public funds and invite public censure rather than public support of highway planting programs.

Good design can include "built in maintenance" features that will eliminate maintenance operations after the construction is completed.

Plantings should be done in large groups to create the effect of spaciousness, and done in such a manner that it will appear as a planting bed with no maintenance necessary within the bed area. It should be large enough to be effective when viewed at a speed of sixty miles per hour. Perhaps a conclusion should be drawn to the effect there should be a restriction as to the number of species planted together. Planting design for a particular area should be based on need, ecology and maintenance.

Selection of Plant Types

What kind of plant material should be used? If planting is to be done, the landscape architect must study and know the plants in the region. It isn't a case of perusing a nursery catalogue. Plants not ideally adapted to a particular site will require greater care. The objectives should be that anything planted must be able to take care of itself once established.

The requirements of plant establishment relate directly to surface soil fertility, to stability, to temperature and moisture, to slope and

direction of exposure, and to the drying effects of surface wind velocities. Therefore, recognition of adverse physical conditions and knowledge of means of reducing them to the greatest extent possible are basic in relation to economical planting programs. As plants must be adaptable to site conditions, one important factor relating directly to design and construction standards is slope gradients.

Exposure has a definite bearing on success in plantings and decreased maintenance. It is common knowledge that it is more difficult to establish and maintain plant growth on slopes facing south and west than those facing north and east because they are degrees hotter on a warm summer day. Hence slopes facing south and west dry out faster and require more water. Recognition of the importance of exposure as a factor in maintenance savings is fundamental.

Plants for Various Barriers

An intelligent field study of physical conditions and a thorough knowledge of plants growing locally or known to be adapted locally are prerequisites to success in planting and to solving problems of low maintenance costs. Planting of trees can screen an objectionable view, an adjacent railroad or frontage road. Trees may be used to accentuate road alignment changes or as living snow fences and always serve to highlight the natural beauty of the roadside view.

The interstate highway will carry heavy traffic which presents problems of noise and fumes in urban and suburban sections. Plantings will help to insulate adjacent residential areas, schools, motels, and other properties from the fumes and noise of traffic. Trees have another function to help balance the carbon monoxide automobiles and trucks discharge in the air.

An ample right-of-way with existing and planted trees well back from the pavement also promotes safety and lessens the chance of serious accidents if the motorist must leave the highway in an emergency. Fallen leaves will not reach the pavement or shade prolong ice conditions there. Trees can do much to relieve the monotony of driving over long stretches of highway by introducing variety and interest in roadside and skyline scenery, and add much to the safety as well as the pleasure of motorists.

Trees planted will serve utilitarian purposes for which an underplanting of shrubs or multiflora roses may serve as livestock fences. By extending the woody plants into the right-of-way it will accentuate the transient and will reduce the areas to be mowed.

The greatest concentration of planting, no doubt, will be within the interchange areas. There the plantings will serve many of the functional purposes mentioned previously.

Maintenance on Plantings

Maintenance on plantings should start immediately. Any delay may occasion a weakening of plants which could be fatal—the difference between success and failure. Special care is of utmost importance the first and second years after planting and the kind and amount of care varies with the site and plant species.

REST AREAS

Developing highways today that will be serving the public in an overall satisfactory manner not only entails the safe movement of vehicles, but also the safe stopping and parking of vehicles well off the travel way.

Much of the travel on the interstate highway is expected to be of the long-haul type. The monotony, eyestrain, and fatigue of constant driving justify the need for occasional well located, well designed places where the motorist can stop safely for rest and recuperation. Safety rest areas are recognized as fulfilling this highway need. They are located back of the normal right-of-way line to eliminate possible parking on the shoulder, and to encourage travelers to drive into the park and use the parking area provided for them. The rest areas include normal services for motorists and provide "Travel Tips" which give information concerning the location of service facilities, road conditions, and scenic, historical, and recreational areas. The motorist services also cover location of service facilities at the next interchange as well as telephone service.

CHEMICAL CONTROL OF VEGETATION

Today the landscaping of highways must also include the use of chemicals to control vegetation. A new type of acreage is becoming manifest in our economy, narrow strips seem to be inevitable. What does all of this amount to, acreage wise? The State of Ohio has approximately 16,000 miles of rural state highways, or a conservative figure of 80,000 roadside acres. This long acreage is a challenge for new techniques. Still, whatever methods we employ must satisfy the basic needs of the highway department.

Weeds are the chief cause of the unkempt appearance of the roadsides and to control them the Ohio Department of Highways has established a weed spray program. The spray must be strictly coordinated with the mowing operations and for maximum safety of the farm crops in the area.

Soil sterilants applied directly under guard rails will control all growth and eliminate the necessity of costly hand mowing. Where it has been determined that the turf should remain under the guard rail to help prevent erosion on slopes the turf can be treated with a combination of a herbicide and grass growth inhibitor to keep the turf at a desired height, free of weeds and to eliminate hand mowing.

Three of the most important factors in assuring effective control by the use of chemicals are, first, adequate planning; second, adequate supervision by informed and alert personnel, and third, have the men who actually are doing the spraying be well informed as to the material and the spraying operation. This cannot be emphasized too strongly as the success of the operation depends greatly upon these factors.

LAND ADJACENT TO RIGHT-OF-WAY

In President Johnson's address to Congress on February 8th he also asked the Secretary of Commerce to take steps designed to preserve the "natural beauty adjacent to highway right-of-way."

He continued by stating that, "Our present highway law permits the use of up to three per cent of all federal-aid funds to be used without matching for the preservation of natural beauty. This authority has not been used for the purpose intended by Congress. I will take steps, including recommended legislation if necessary, to make sure these funds are used to enhance beauty along our highway system."

There are two ways that land adjacent to the right-of-way can be acquired. One is the Rural Scenic Easement which in effect is "an interest in or servitude over agricultural land adjoining the parkway under which the owner surrenders his right to change the manner of use of his land."

Such an easement would not allow the state to enter the land for any purpose without the owner's permission. The owner could continue to cultivate the land and use it for pasture or other normal farming pursuits but could not erect billboards or change the manner of use.

The other means by which adjoining scenic land can be acquired is covered in Public Roads Memorandum Number 126, dated June 21, 1941, and is the one referred to by the President. It is titled "Use of Federal Funds for the Purchase of Land Adjacent to Highway Right-Of-Way for the Preservation of the Natural Beauty Through Which Highways are Constructed."

It is a means to preserve small portions of the vanishing native landscape—small portions but important ones because they are seen by all highway travelers.

The interstate highway system is being built for future generations to use and enjoy. These roads must be planned with care and foresight that comes from the full cooperation of the highway engineer and the highway landscape architect—cooperation that starts in the design stage to incorporate utility, safety, beauty, and economy, to emerge as a “Complete Highway.”